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| 10/537,891 | 06/07/2005 | Wojtek Sudol | US020535US | 7204 |
| 24737 7590 05/02/2008 PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510 | | | | |
| EXAMINER LAMPRECHT, JOEL | | | | |
| ART UNIT 3737 | | PAPER NUMBER | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/537,891

Applicant(s)

SUDOL ET AL.

Examiner

JOEL M. LAMPRECHT

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/25/08 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5, 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hadjicostis et al (US 5,947,905) in view of Eberle et al (US 6,049,958). Hadjicostis et al disclose an ultrasonic transducer with a housing (Fig 1-8), acoustic elements (Fig 7b, Col 5 Line 60 – Col 6 Line 10), an integrated circuit adjacent to the acoustic elements (Col 5 Line 60 – Col 6 Line 10), a first connection means and second connection means for connecting the acoustic elements to an integrated circuit and connection that integrated circuit to electrical transmission lines (Col 5 Line 60 – Col 6 Line 55), where the first connection means are comprised of metal bumps and solder bumps and the second connection means is comprised of one of wire-bonds, direct wire attachments and tab bonding of leads (Col 7 Line 1-65). Hadjicostis et al also disclose interconnection substrate for the second connection means comprising a thin film circuit (Col 7 Line 35-50) with ceramic and laminate portions (Col 7 Line 35-40), an intermediate interconnection substrate comprising a flexible circuit, and a semi-rigid circuit or a rigid circuit, a bent interconnection, so that the horizontal length is less than fifty percent of a horizontal length of the integrated circuit (Col 9 Line 10 – Col 10 Line 30). Hadjicostis et al disclose an ultrasonic transducer with a thermally coated body (Col 7 Line 1-40), flexible circuit with electronic components on one portion and acoustic components on another portion of the circuit contacting the body (Col 6 Line 50 – Col 7 Line 15, Col 8 Line 10 – 65), the acoustic assembly including acoustic elements and an integrated circuit coupled to the acoustic elements (Col 8 Line 10 – Col 9 Line 37), with two rows of wire-bonds along each pair of opposed edges (Col 6 Line 10 - 40). The flexible circuit having two planar portions on opposite sides of a body, connection means

with two additional flexible circuits with connections for signal transmission lines, and a flap portion separated from the first planar portion and connections means with one additional flexible circuit having connections for signal transmission lines and conductive film or adhesive attaching the additional flexible circuit to the flap portion of the circuit (Col 5 Line 10- Col 6 Line 50).

Regarding claims 23-25 Hadjicostis et al disclose a transducer with a flexible circuit having connection sites (Col 5 Line 10-40), an acoustic assembly mounted on a flexible circuit and comprising an integrated circuit having connection sites and acoustic elements electrically coupled to an integrated circuit (Col 7 Line 5-54), electronic components for control of the acoustic assembly connected in a circuit defined in part by a flexible circuit (Col 8 Line 14 – Col 9 Line 10), two wire-bonds connecting the connection sites of the integrated circuit and the connection sites of the flexible circuit along each opposed edge.

Hadjicostis et al disclose the use of an integrated circuit and an acoustic stack connected to the integrated circuit with electrical connection lines on the same surface as the acoustic stack, but do not disclose the use of one common surface of the integrated surface for placement of both the acoustic elements and connection means as the connection means is placed on one end of the integrated circuit and the acoustic elements are connected to that connection means. Attention is then directed to the secondary reference by Eberle et al in the same area of endeavor which discloses the use of an acoustic stack and connection elements on the same surface of an integrated circuit (Col 2 Line 65-Col 3 Line 20). It would have been obvious to one of ordinary skill

in the art at the time of the invention to have included the arrangement of acoustic elements of Eberle et al with the ultrasound transducer assembly of Hadjicostis et al for the purpose of reducing resistance between connection lines and improving overall signal fidelity.

Claim 6-22 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hadjicostis et al in view of Eberle et al (US 6,049,958) and in further view of Marian Jr (US 7,022,080 B2). Hadjicostis et al in view of Eberle et al substantially disclose the invention as listed above, but fail to disclose that a portion of the interconnection extends in a first direction along a communication means and then extends at least perpendicularly in a second direction along the connection means or that bends at least at a perpendicular angle to define some cavity which contains thermally conductive elements and defining a transmission line which connects signal lines to electric components and the acoustic assembly. Attention is directed to Marian Jr which describes the use of a flexible circuit having at least a perpendicular bend which in part creates a cavity around thermally conductive elements connected to the circuit which has both flexible and rigid portions (Figure 2, Col 3 Line 30-Col 4 Line 45, and Column 7 line 35-Column 8 Line 12). While designs are chosen for both aesthetic, machining, and functional properties and therefore are never identical, the flexible circuit with a bendable element of Marian Jr would have been obvious to one of ordinary skill in the art at the time of the invention for use in conjunction with the system of Hadjicostis et al and Eberle et al for the purpose of providing for a cost-efficient, connectively flexible

transducer element which is able to electrically couple more elements more efficiently along the electronic pathway.

Response to Arguments

Applicant's arguments filed 1/25/08 have been fully considered and reference by Eberle et al has been added to provide for the deficiencies of Hadjicostis et al. Regarding the argument that Hadjicostis does not disclose or suggest a method for manufacturing an ultrasonic transducer with an 180 degree bend and flexible circuit with acoustic assembly and electronic components on the same axis the Examiner has relied upon the Marian Jr reference in the case of claims 6-22 and 26-27 to overcome that claimed embodiment. In response to the argument that the Marian reference does not disclose the use of transducer elements on a printed circuit, attention is directed to the discussion of Column 7 Lines 35-Column 8 Line 12 which discloses the transducer elements positioned on the flexible circuit (100) of Figure 2.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL M. LAMPRECHT whose telephone number is (571)272-3250. The examiner can normally be reached on Monday-Friday 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571)272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ruth S. Smith/
Primary Examiner, Art Unit 3737

JML